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Case Report

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Rapidly developing massive thromboembolism and death due to anticoagulant dose reduction in a patient with atrial fibrillation: Case Report

Ömer Faruk İpek[1], Mustafa Alpaslan[2], Murat Eşlik[3], Tülay Çakmak Coşkun, Necmi Baykan

[1]Department of Primary Health Care, Primary Health Care Corporation, Qatar
[2]Department of Emergency Medicine, Nevşehir State Hospital, Nevşehir, Türkiye
[3]Department of Emergency Medicine, Kayseri City Hospital, Kayseri, Türkiye

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Corresponding Author: Necmi Baykan, mdrnecmibaykan@gmail.com

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ABSTRACT

Atrial fibrillation is one of the cardiac arrhythmias that can cause fatal complications. Patients diagnosed with atrial fibrillation face complications such as ischemic stroke, peripheral vascular embolism and pulmonary embolism if they are not under regular and strict treatment follow-up. In this case, in a 73-year-old woman with atrial fibrillation who was not receiving regular treatment, sudden onset of leg pain followed by rapid onset of dyspnea was clinically suggestive of acute peripheral arterial embolism followed by massive pulmonary embolism. The patient was tachypneic and confused at the time of presentation to the emergency department. After intubation with sedation and analgesia, radiologic imaging was obtained for possible complications secondary to atrial fibrillation. As a result, the patient had an embolus starting from the level of the abdominal aorta, extending to the right renal artery and spreading to the entire right iliac artery. The lung tissue showed bilateral acute lung injury without pulmonary embolism. In this case, we wanted to emphasize the importance of the subject by sharing the rapidly developing embolism and death process with the reduction of the anticoagulant dose used in the treatment of atrial fibrillation.

Keywords: Warfarin, embolism and thrombosis, atrial fibrillation

INTRODUCTION

Clinically, atrial fibrillation is the most common type of arrhythmia to be treated. Diseases such as hypertension, diabetes mellitus, chronic obstructive pulmonary disease and chronic renal failure, especially coronary artery disease, valvular heart disease and heart failure may also lead to the development of atrial fibrillation.[1] Atrial fibrillation is one of the most important factors causing acute peripheral vascular embolism. Acute pulmonary thromboembolism, ischemic stroke and myocardial infarction are the most mortal complications of peripheral vascular embolism.[2] In this case report, we describe a patient with atrial fibrillation who developed sudden onset of leg pain followed by rapidly developing dyspnea and syncope days after the dose of warfarin was reduced, which resulted in death in a short period of time.

CASE

A 73-year-old woman was brought to the emergency department by ambulance with complaints of sudden onset of leg pain followed by shortness of breath and fainting. When the patient arrived, her general condition was assessed as moderate-poor, consciousness was confused and GCS (Glasgow Coma Scoring) score was 9. When the vital values of the patient were examined, fever was 36.7ºC, pulse rate was 140/minute, blood pressure was 90/50 mm/Hg, and oxygen saturation was 78. The patient's fingertips appeared cyanotic. There was no pulse in the right lower extremity and circulatory disturbance was observed. The patient was intubated with sedoanalgesia and connected to a mechanical ventilator. The patient's medical history included hypertension, diabetes mellitus, coronary artery disease and atrial fibrillation in the heart rhythm. The patient was diagnosed with atrial fibrillation five months ago. The patient was regularly taking a single daily dose of warfarin 5mg/day, but the dose was changed to 2.5 mg/day after the INR control value was 5.8 one week ago. According to the statement of the patient's relatives, the patient had been taking her medication regularly at a dose of 2.5 mg/day for one week. Approximately two hours before he was admitted to the emergency department, she suddenly developed pain in her leg and shortness of breath started in the following period. The ambulance was then called after he suddenly lost consciousness. Laboratory tests revealed white blood cell count: 17.99 x 10^3/mm^3, hemoglobin: 15.1 g/dl, platelets: 367 103/mm^3, blood glucose level:466 mg/dl, troponin T: 61.1 ng/dl, D-dimer: 19682 ng/dl, PT: 15.4, PTT: 39.3 and INR level 1.06. Other biochemical values were within normal range. In the arterial blood gas evaluation of the patient receiving oxygen support, pH: 6.76, pCO2: 55.4 mmHg, pO2: 74.1 mmHg, HC03: 5.9 mmol/L, lactate: 1.35 mmol/L and deep metabolic acidosis was observed.

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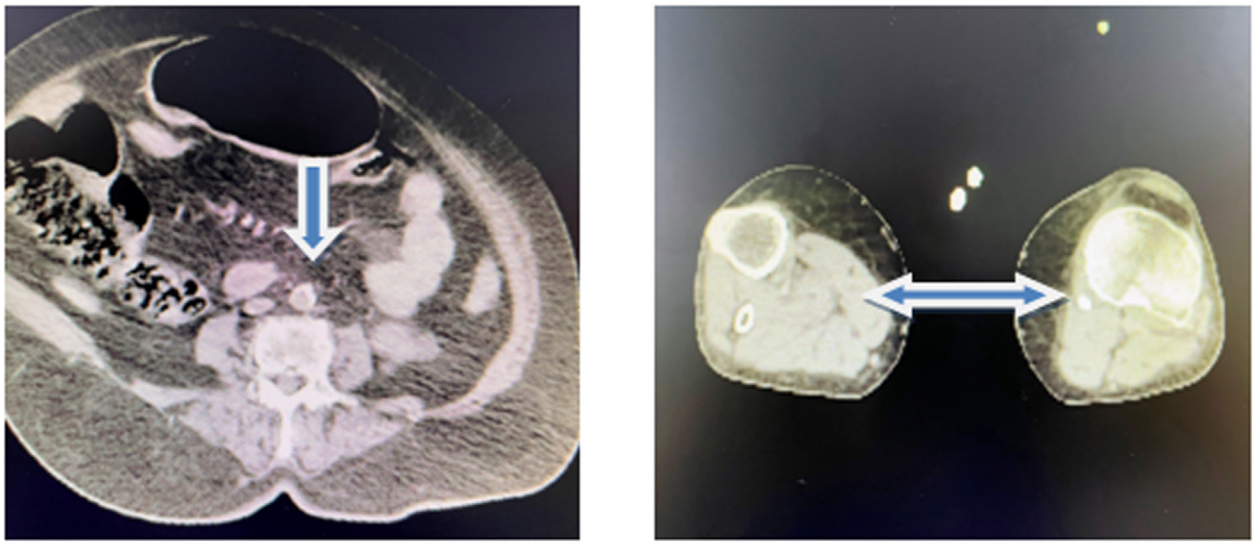

Figure 1. Embolism seen at the level of the abdominal aorta and the right lower extremity in the computed tomography angiography image

Computerized brain tomography image was first obtained from the patient. Subsequently, arterial phase imaging was performed in the computerized tomography (CT) scanner to visualize the pulmonary vessels, abdominal aorta and peripheral lower extremity arteries using contrast material. Diffusion MR imaging was also performed to rule out unconsciousness in the patient who had no pathologic findings on brain CT. As a result, the patient had embolism starting from the level of the abdominal aorta, extending to the right renal artery and extending to the entire right iliac artery (**Figure 1**). Posteroanterior chest radiography and computed tomography of the thorax showed diffuse ground-glass density in both lungs (**Figure 2**).

Echocardiography was performed and revealed biatrial dilatation and severe mitral and tricuspid valve insufficiency. There was no evidence of pulmonary embolism on echocardiography. The patient was admitted to the intensive care unit for follow-up and treatment. High dose positive inotropic support was given. In the following period, the patient was operated by the cardiovascular surgery clinic. After the operation, the patient's hypotension and respiratory failure symptoms deepened and the patient died. The patient's death occurred approximately 20 hours after the onset of clinical findings.

DISCUSSION

Acute peripheral arterial embolism has an important place in patient morbidity and mortality with complications that threaten limb survival and may also develop. Other accompanying comorbid diseases also affect the clinical course.[3] In this case, the INR value was 5.8 one week ago and decreased to 1.06 after halving the daily dose of warfarin. We found that warfarin use was not effective and the INR value was not in the therapeutic range (2.5-3.5). The patient's D-dimer level of 19682 ng/dl (200-400 ng/dl) was quite high, suggesting that massive thromboembolism might develop. According to the blood gas analysis obtained with oxygen support on admission, the patient had profound metabolic acidosis, suggesting that tissue breakdown was extremely rapid. In the light of the anamnesis, physical examination and laboratory findings, imaging studies were performed considering the possibility of massive thromboembolism. In this case, we first thought that it would be massive pulmonary embolism. However, we found that there was an embolism starting from the level of the abdominal aorta, extending to the right renal artery and extending to the entire right iliac artery, and bilateral tissue damage developed in the lung without pulmonary embolism.

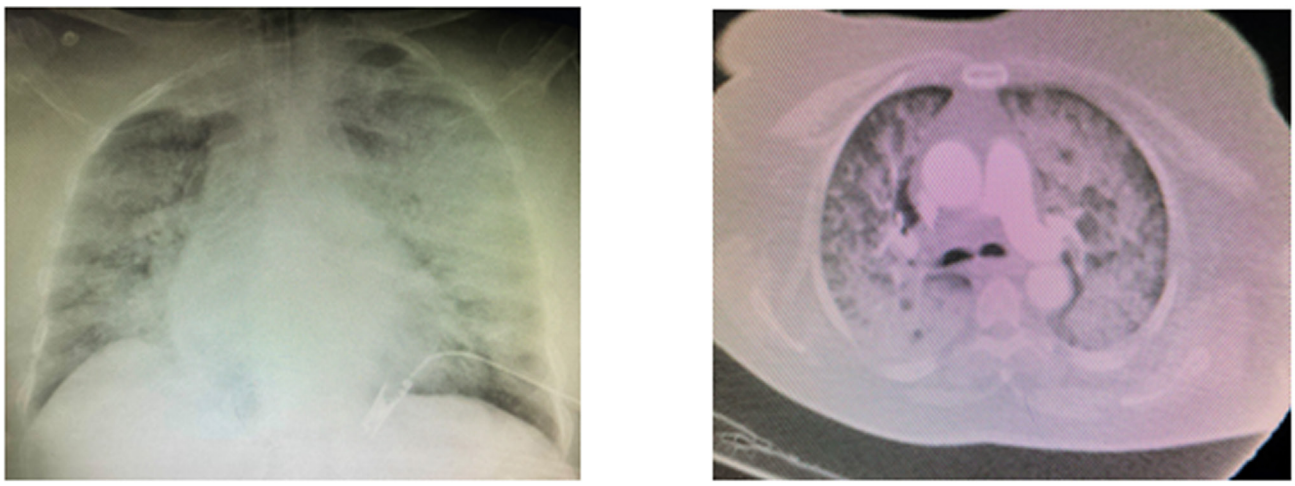

Figure 2. Diffuse ground-glass density image on posteroanterior chest radiography and computed tomography angiography

Surgical intervention within 8-12 hours from the onset of symptoms is an important part of arterial embolectomy and is defined as the ideal time for success.[4] In this case, although the patient's unstable vital signs prolonged the duration of the surgical operation, the patient was taken into operation approximately ten hours after arrival under supportive treatment.

Atrial fibrillation is the most common rhythm disorder that has been characterized as permanent in recent years.[5,6] Atrial fibrillation is a progressive disease and is often accompanied by other systemic diseases. Although there is no clear treatment protocol yet, the aim should be to reduce cardiovascular mortality and morbidity. In this regard, the main focus should be on preventing thromboembolic diseases and reducing hospitalizations. The two main elements in treatment are control of ventricular rate by ensuring sinus rhythm and prevention of thromboembolic events.[7]

Warfarin treatment is the most effective method to prevent thromboembolism. In a meta-analysis, the relative risk reduction in all ischemic stroke cases was found to be significant at 64%, corresponding to an absolute annual risk reduction of 2.7%.[8] Similar to our case, according to the case report of Coutrot et al.[9], in an elderly patient admitted to the hospital with epistaxis and on warfarin for atrial fibrillation, the INR level was measured as >10 and after repeated vitamin K treatment, the INR level was <2. Subsequently, it was observed that the patient suddenly developed massive pulmonary embolism.Similarly, in another case, a 56-year-old male patient presented to the emergency department with complaints of dyspnea and chest pain as well as pain and swelling in both legs. Although the patient was taking warfarin at a therapeutic dose since he had undergone aortic valve replacement, pulmonary embolism developed.[10]

CONCLUSION

As seen in the case examples and in our case, anticoagulant use and dose adjustment in patients with atrial fibrillation and risk of embolism is a very challenging task and fatal complications are inevitable. The dose of warfarin is extremely important and regular use and careful attention should be paid to the use of drugs and food consumption that may interact with it. We concluded from this case that the INR control period should be shorter and more controlled during the process of dose reduction.

ETHICAL DECLARATIONS

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declared that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Hindricks G. Potpara T. Dagres N. et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio¬Thoracic Surgery (EACTS). *Eur Heart J*. 2021;42(5):373-498.
2. Albertsen IE, Rasmussen LH, Overvad TF, Graungaard T, Larsen TB, Lip GY. Risk of stroke or systemic embolism in atrial fibrillation patients treated with warfarin: a systematic review and meta-analysis. *Stroke*. 2013; 44(5):1329-1336.
3. Katırcıoglu EG, Yalcın M, Unlu Y. Akut periferik arteryel emboli vakalarinda girişim zamanlamasının müdahale sonuçları üzerine etkisi. *Atatürk Üniv Tıp Fak Cerr Tıp Bil Derg*. 2023;2(1):5-12.
4. Haimovici H, Ascer E, Hollier LH. Arterial embolism of the extremities and technique of embolectomy. In: H. Haimovici ed. Vasculer Surgery. Cambridge Masachusets Blackwell Science, Fourth edition 1996; 423-444.
5. Stewart S, Hart CL, Hole DJ, McMurray JJ. Population prevalence, incidence, and predictors of atrial fibrillation in the Renfrew/Paisley study. *Heart*. 2001;86(5):516-521.
6. Go AS, Hylek EM, Phillips KA, et al. Prevalence of diagnosed atrial fibrillation in adults: national implications for rhythm management and stroke prevention: the anticoagulation and risk factors in atrial fibrillation (ATRIA) study. *JAMA*. 2001;285(18):2370-2375.
7. Karaçağlar E, Atar İ, Yetiş B. ve ark. Atriyal fibrilasyon hastalarında emboli risk faktörleri sıklığı ve emboli önleyici tedavilerin uygunluğunun araştırılması: tek üçüncül bir merkez deneyimi. *Anadolu Kardiyol Derg*. 2012;12(5):384-390.
8. Hart RG, Pearce LA, Aguilar MI. Meta-analysis: antithrombotic therapy to prevent stroke in patients who have nonvalvular atrial fibrillation. *Ann Intern Med*. 2007;146(12):857-867.
9. Coutrot M, Delrue M, Joly BS, Siguret V. Unexpected acute pulmonary embolism in an old COVID-19 patient with warfarin overdose: a case report. *Eur Heart J Case Rep*. 2021;5(6):206.
10. Aysel S, Ramazan E, Ahmet A. Massive pulmonary embolism in a patient using warfarin at therapeutic dose. *J Clin Diagn Res*. 2016;10(9):9-10.